

Applicant : Joachim Kröll, Hermann Franzen and Mathias Dobner
For : LOADING AND UNLOADING STATION IN A
SEA PORT OR RIVER PORT
International Filing Date : 12 February 2004
International Application No. : PCT/EP2004/001291
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The listing of the claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS:

Please amend claims 1-12.

Please add new claims 13-24.

1. (Currently Amended) Handling facility at a seaport or inner harbor, ~~especially for ISO containers,~~ with a container terminal (1) ~~arranged alongside a wharf, consisting of said container terminal including~~ individual storage modules (8) ~~arranged in rows, and at least one loading facility interacting with the storage modules (8) for the cargo handling to and from a ship (3) lying docked at the wharf, where in said handling facility comprising:~~
_____ at least one elevated stacking crane (7) ~~per storage module (8) takes charge of, said at least one elevated stacking crane handling~~ the receiving, the horizontal transporting, and the stacking of the containers (17) ~~and interacts with;~~
_____ cross transporters (18) ~~acting independently of each other and able to travel on a different horizontal level transverse to the individual storage modules (8), said cross transporters being responsible for the horizontal transporting of containers (17) between the storage modules (8), characterized in that a number of;~~
_____ more than two ~~of said~~ cross transporters (18) ~~depending on the size of the container terminal (1), can being adapted to move on the a same level beneath the a transport level of the said at least one elevated stacking cranes (7) crane and above the truck loading lanes (11.2 and 11.4) on at least one railway (21, 22) extending transversely to the storage modules (8) into the a region of interim storage stations (16) assigned to each storage module (8), each of the said interim storage stations being arranged sideways and parallel to the said at least one railway (21, 22) of the cross transporter (18) and forming interfaces between the said at least one elevated stacking crane (7) and the said cross transporters (18).~~

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2. (Currently Amended) Handling facility ~~per~~according to Claim 1, ~~characterized in that~~
wherein each cross transporter (18) is outfitted with a transfer or receiving device for moving a
container (17) from or to an interim storage station (16).

3. (Currently Amended) Handling facility ~~per~~according to Claim 2, ~~characterized in that~~
~~the~~wherein said transfer or receiving device ~~consists of~~includes a load carrier (18.2) for the
container (17) that can shift or travel into the region of the interim storage station (16),
transverse to the direction of travel of ~~the~~said cross transporter (18).

4. (Currently Amended) Handling facility ~~per~~according to Claim 3, ~~characterized in that the~~
wherein said load carrier (18.2) is configured as a linear driven shunt cart, ~~which can said shunt~~
cart adapted to travel on another railway ~~railways (18.3) arranged on the said cross transporter~~
~~(18) transporters.~~

5. (Currently Amended) Handling facility ~~per Claims 1 to~~according to Claim 4, ~~characterized in~~
~~that the~~ wherein said interim storage stations (16) ~~are~~ are configured as angle brackets, and reach at
least partially freely across ~~the said at least one~~ railway (21, 22) and ~~the one said~~ cross transporter
(18) so that ~~the said~~ load carrier (18.2) can travel underneath ~~the one said~~ interim storage station
(16) when ~~the said one said~~ cross transporter (18) is positioned underneath ~~the that~~ interim
storage station (16), ~~while and further including~~ sideways running open slots (16.1) are provided
in the horizontal part of the angle bracket in the direction of ~~the said~~ load carrier (18.2), ~~which~~
are said slots engaged by vertical lifting devices for the container (17), arranged on ~~the said~~ load
carrier (18.2) and reaching underneath ~~the~~ support points of the container (17).

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6. (Currently Amended) Handling facility ~~per~~according to Claim 5, ~~characterized in that~~
~~the~~wherein said vertical lifting devices of the load carrier (18.2) are configured as hydraulic
piston and cylinder units.

7. (Currently Amended) Handling facility according to ~~one of Claims 1 to~~ Claim 6,
~~characterized in that~~wherein said at least one railway comprises at least two railways (21, 22)
running parallel to each other traverse the container terminal (1) ~~transverse to the storage~~
modules (8), said at least two railways being joined together at the head end by change-over
devices (19, 20) ~~for the~~said one said cross transporter (18), in order to enable a switching of
~~the~~said one said cross transporter (18) from one of ~~the~~said at least two railways (21 ~~or~~ 22) to the
other ~~parallel railway (22 or 21)~~of said at least two railways.

8. (Currently Amended) Handling facility according to ~~one of Claims 1 to~~ Claim 7,
~~characterized in that the~~including driving lanes (11.1, 11.3) for the trucks (9) ~~that~~ travel
underneath the ~~railways (21, 22)~~said at least one railway.

9. (Currently Amended) Handling facility according to ~~one of Claims 1 to~~ Claim 8,
~~characterized in that the~~including loading lanes (11.2, 11.4) for the trucks (9) ~~that~~ travel
underneath alongside the interim storage stations (16).

10. (Currently Amended) Handling facility ~~per~~according to Claim 7, ~~characterized in that~~
~~the~~wherein said cross transporters (18) are timed to travel in a particular direction of turning
(24) ~~on the parallel runnings~~said at least two railways (21, 22) and ~~the~~said change-over devices
(19, 20) at the head end.

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11. (Currently Amended) Handling facility ~~per~~according to Claim 7, ~~characterized in that the~~wherein said change-over devices ~~(19, 20) each consist of each include~~ a bridgelike steel structure with lengthwise running railways ~~(23)~~, whose gauges correspond to those of ~~the~~said at least two railways ~~(21, 22)~~ for the cross transporters ~~(18)~~, and ~~the~~said change-over devices are provided with rail travel mechanisms at the front end, which can travel on said lengthwise running railways ~~(23)~~ between ~~the~~said at least two railways ~~(21, 22)~~ of the cross transporters ~~(18)~~ that are elevated at the head end transverse to ~~the~~said at least two railways ~~(21, 22)~~ of the cross transporters ~~(18)~~ and move into end positions in which ~~the~~said at least two railways on the bridgelike steel structure are aligned with one of ~~the~~said at least two railways ~~(21, 22)~~ for the cross transporter.

12. (Currently Amended) Handling facility according to ~~one of Claims 1 to~~Claim 7, ~~characterized in that the~~wherein said interim storage stations ~~(16)~~ are fastened by the vertical legs of ~~the~~said angle brackets to the side of the girders for ~~the~~said at least two railways ~~(21, 22)~~ and are configured to accommodate up to four containers ~~(17)~~ per storage module ~~(8)~~.

13. (New) Handling facility according to Claim 1, wherein said interim storage stations are configured as angle brackets and reach at least partially freely across said at least one railway and one said cross transporter so that said load carrier can travel underneath one said interim storage station when said one said cross transporter is positioned underneath that interim storage station and further including sideways running open slots in the horizontal part of the angle bracket in the direction of said load carrier, said slots engaged by vertical lifting devices for the container, arranged on said load carrier and reaching underneath support points of the container.

14. (New) Handling facility according to Claim 13, wherein said vertical lifting devices of the load carrier are configured as hydraulic piston and cylinder units.

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15. (New) Handling facility according to Claim 2, wherein said interim storage stations are configured as angle brackets and reach at least partially freely across said at least one railway and one said cross transporter so that said load carrier can travel underneath one said interim storage station when said one said cross transporter is positioned underneath that interim storage station and further including sideways running open slots in the horizontal part of the angle bracket in the direction of said load carrier, said slots engaged by vertical lifting devices for the container, arranged on said load carrier and reaching underneath support points of the container.

16. (New) Handling facility according to Claim 15, wherein said vertical lifting devices of the load carrier are configured as hydraulic piston and cylinder units.

17. (New) Handling facility according to Claim 3, wherein said interim storage stations are configured as angle brackets and reach at least partially freely across said at least one railway and one said cross transporter so that said load carrier can travel underneath one said interim storage station when said one said cross transporter is positioned underneath that interim storage station and further including sideways running open slots in the horizontal part of the angle bracket in the direction of said load carrier, said slots engaged by vertical lifting devices for the container, arranged on said load carrier and reaching underneath support points of the container.

18. (New) Handling facility according to Claim 17, wherein said vertical lifting devices of the load carrier are configured as hydraulic piston and cylinder units.

19. (New) Handling facility according to Claim 1, wherein said at least one railway comprises at least two railways running parallel to each other traverse the container terminal transverse to the storage modules, said at least two railways being joined together at the head end by

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change-over devices for said one said cross transporter, in order to enable a switching of said one said cross transporter from one of said at least two railways to the other of said at least two railways.

20. (New) Handling facility according to Claim 1, including driving lanes for trucks that travel underneath said at least one railway.

21. (New) Handling facility according to Claim 1, wherein said loading lanes travel underneath alongside the interim storage stations.

22. (New) Handling facility according to Claim 19, wherein said cross transporters are timed to travel in a particular direction of turning on said at least one railway and said change-over devices.

23. (New) Handling facility according to Claim 19, wherein said change-over devices each include a bridgelike steel structure with lengthwise running railways, whose gauges correspond to those of said at least two railways for the cross transporters, and said change-over devices are provided with rail travel mechanisms at the front end, which can travel on said lengthwise running railways between said at least two railways of the cross transporters that are elevated at the head end transverse to said at least two railways of the cross transporters and move into end positions in which said at least two railways on the bridgelike steel structure are aligned with one of said at least two railways for the cross transporter.

24. (New) Handling facility according to Claim 1, wherein said interim storage stations are fastened by the vertical legs of said angle brackets to the side of the girders for said at least two railways and are configured to accommodate up to four containers per storage module.